

Name: _____ Date: _____

Polynomial Factoring solution (version 32)

1. The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.

$$x^2 + 2x + 25 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(25)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 100}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-96}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{6}i}{2}$$

$$x = -1 \pm 2\sqrt{6}i$$

Notice that i is NOT under the square-root radical symbol!!

2. Express the product of $-8 - 3i$ and $2 - 4i$ in standard form $(a + bi)$.

Solution

$$(-8 - 3i) \cdot (2 - 4i)$$

$$-16 + 32i - 6i + 12i^2$$

$$-16 + 32i - 6i - 12$$

$$-16 - 12 + 32i - 6i$$

$$-28 + 26i$$

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3. Write function $f(x) = x^3 - 3x^2 - 16x - 12$ in factored form. I'll give you a hint: one factor is $(x - 6)$.

Solution

$$\begin{array}{c|cccc} & 1 & -3 & -16 & -12 \\ 6 & 6 & 18 & 12 & \\ \hline & 1 & 3 & 2 & 0 \end{array}$$

$$f(x) = (x - 6)(x^2 + 3x + 2)$$

$$f(x) = (x - 6)(x + 1)(x + 2)$$

4. Polynomial p is defined below in factored form.

$$p(x) = (x - 1) \cdot (x - 4)^2 \cdot (x - 8)$$

Sketch a graph of polynomial $y = p(x)$.

